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REVIEW OF ACCURACY AND COMPLETENESS OF AVAILABLE STATISTICS ON BAUXITE, ALUMINA AND ALUMINIUM AND POSSIBLE MEASURES TO BE TAKEN THEREON

Review of the accuracy and completeness of statistics on bauxite, alumina and aluminium

Report by the UNCTAD secretariat

GE.94-50547 (E)

NOTE

The Second Ad Hoc Review Meeting on Bauxite held in April 1993 requested the UNCTAD secretariat to prepare a report to assist discussions under item 4 of the provisional agenda for the third session. In this context, several participants declared that they would provide the secretariat with suggestions in this regard, and that they would make efforts to communicate their ideas to the secretariat before 31 July 1993. A communication received from Canada is annexed to the present document. A first draft of the present report was sent by the secretariat in November 1993 to all the delegations that participated in the Second Ad Hoc Review Meeting. Comments were received from Australia and the OECD secretariat and were taken into account in the final version.

INTRODUCTION

1. In the non-ferrous metal industry, the need for more timely, complete and accurate information is increasingly recognized. A greater transparency of the market plays a major role in the process of decision-making, at the industry as well as at the Government level.

2. Although statistical problems vary with the structure of each metal industry, the whole non-ferrous metals sector currently experiences increasing difficulties in producing or obtaining the information needed. Changes in the overall economic and political situation of the world are generally considered as responsible for the deterioration of the availability of comprehensive and reliable statistics, in particular:

(i) Constraints on public expenditure, deregulation, privatization, and the general move toward "less government" have in many instances reduced the effectiveness of governmental statistical collecting and releasing agencies.

(ii) Severely affected by the 1980s recession, the mining and metal producing industries reduced or at least delayed their participation in routine statistical enquiries: the timeliness and quality of responses consequently deteriorated.

(iii) With more severe international competition, producing companies have become more concerned about commercial secrecy, asking for the suppression of details of their activity. The existence of only few companies in a country resulted sometimes in the absence of detailed information for the whole country.

(iv) The fact that significant volumes of production and consumption take place in a wider range of countries has complicated the problems of collecting and analysing data.

(v) Last but not least, as stated by Metallgesellschaft in the introduction to its 1991 edition of Metal Statistics : "the opening up of Eastern Bloc is resulting in an abundance of partially contradictory information on their non-ferrous metal industries. Part of the problem is due to the fact that the 'statistical language' is different to that spoken in the West. It is to be hoped that with the introduction of a market economy, the necessity for a uniform "language" is recognized and alignment is made with the standards of Western statistics. Until then, for most countries we will have to rely, now as before, on analysis of Western trade statistics in order to estimate trends in consumption".

3. The world bauxite/alumina/aluminium industry does not escape these statistical problems. In this report, an attempt has been made to analyse in detail the specific problems affecting the industry and to make suggestions for dealing with them.

I. DEFINITIONS

4. Before entering into consumption, aluminium is mined as bauxite, transformed into an intermediate product (alumina) and converted into metal. A summary of definitions and units commonly used is given below:

A. Bauxite

5. The most common source of primary aluminium is bauxite, the use of other aluminium-bearing materials such as alunite and nepheline syenite being still marginal and confined to the former USSR countries. Production of alumina does not, however, constitute the only outlet for bauxite, although it accounts for the major part (about 90%) of bauxite consumption. About one tenth of bauxite mined is directly used in the production of refractories, abrasives and cements and in the chemical industry.

6. Quantities of bauxite are usually expressed in terms of actual wet or dry weight, unlike ores of other non-ferrous metals for which the average metal content (recoverable or by analysis) is given.

B. Alumina

7. Transformation of bauxite produces alumina in the form of an hydroxide. About 90 per cent of the alumina production is used to produce aluminium, while the rest is used directly in refractories, cement, chemical and other minor industries. Depending on the specific quality of the bauxite used, a varying amount of the aluminium present in the ore stays as silicate and cannot be recovered. As in the case of bauxite, quantities of alumina are almost always expressed in terms of actual weight.

C. Aluminium

8. Production of aluminium may originate from two sources: primary, by electrolysis of calcined alumina, and secondary, recovered from scrap.

(i) Primary aluminium is usually defined as produced from alumina in pigs, ingots, billets, cakes and wire bar;

(ii) Secondary aluminium is usually defined as produced by smelting of old scrap (discarded products and wastes) and new scrap (scrap deriving from manufacturing operations, rejects and residues).

9. Corresponding distinctions do not exist in trade statistics for aluminium, where primary and secondary are combined under the heading "aluminium unwrought".

10. Most of the time, published consumption figures for aluminium relate to the "apparent consumption" calculated by the availability method, i.e. production plus imports minus exports with adjustments for known changes in stocks. Except for some countries which collect separate data for primary and secondary materials, consumption figures refer to total consumption of aluminium, to which direct use of scrap (that is the scrap that has not been remelted) can be added, when available .

D. Trade nomenclatures

11. Trade data are collected by the Customs administrations, according to the specific definitions of their own Trade Nomenclatures. Currently, a large number of countries implement the nomenclature of the *Harmonized Commodity Description and Coding System*. There is a close correlation between this system and the *Standard International Trade Classification* (SITC) of the United Nations. The table below gives the concordance between the five statistical international trade codes currently in use: the *Standard International Trade Classification* (SITC Rev.1, Rev.2 and Rev.3); the *Customs Co-operation Council Nomenclature* (CCCN); and the *Harmonized Commodity Description and Coding System* (HS).

II. SOURCES

12. Statistical data on aluminium industry are generated, collected and disclosed at various levels, governmental or private, national or international.

A. International sources

1. UNCTAD

13. The UNCTAD Commodity Yearbook provides disaggregated data at the world, regional and country levels for production, trade and consumption of selected primary commodities. It includes detailed data on bauxite, alumina and aluminium. Production and consumption figures are compiled from *Metal Statistics* published by Metallgesellschaft AG. Most of the trade figures, expressed in terms of quantity and value, are officially published or supplied to the United Nations Statistical Office by governments. The rest are estimated by the UNCTAD secretariat with a view to arriving at regional and world aggregates which are as complete as possible.

2. International Bauxite Association (IBA)

14. The membership of the International Bauxite Association (IBA) consists of eight bauxite producing developing countries, namely: Ghana, Guinea, Guyana, Indonesia, Jamaica, Sierra Leone, Suriname and the former Yugoslavia. It publishes a quarterly review with general papers and information on specific aluminium industry developments, but does not systematically release detailed information on bauxite production, trade and consumption at the country or the world level.

3. International Consultative Group on Non-Ferrous Metal Statistics

15. The International Consultative Group on Non-Ferrous Metal Statistics is an informal group of representatives of industry organizations, major companies, government statistical agencies and intergovernmental organizations involved in the preparation of data for the major non-ferrous metals, including bauxite, alumina and aluminium.

Concordance between statistical international trade code

	SITC Rev.1	SITC Rev.2	SITC Rev.3	CCCN	HS
Aluminium ores & concentrates:	283.3	287.31	285.1	ex 26.01	2606.00
Aluminium oxide:	ex 513.65	287.32	285.2	ex 28.20	2818.20
Aluminium hydroxide:	ex 513.65	522.56	522.66	ex 28.20	2818.30
Aluminium waste and scrap:	284.04	288.23	288.23	ex 76.01	7602.00
Aluminium & aluminium alloys, unwrought:	684.1	684.1	684.1	ex 76.01	76.01
- aluminium, not alloyed:			684.11		7601.10
- aluminium alloys:			684.12		7601.20
Aluminium & aluminium alloys, worked:	684.2	684.2	684.2		
- bars, rods, angles, shapes and sections aluminium wire:	684.21	684.21		76.02	
- bars, rods & profiles:	ex 684.21 ex 684.25	ex 684.21 ex 684.25	684.21	ex 76.02	76.04
- wire:	ex 684.21	ex 684.21	684.22	ex 76.02	76.05
- plates, sheets & strip:	684.22	684.22			
- plates, sheets & strips of a thickness exceeding 0.20 mm			684.23	76.03	76.06
- foil (whether or not embossed, cut to shape, perforated, coated, printed or backed with paper or other reinforcing material) of a thickness (excluding any backing) not exceeding 0.20 mm:	684.23	684.23	684.24	76.04	76.07
- powder & flakes:	684.24	684.24	684.25	76.05	76.03
- tubes, pipes & blanks therefor; hollow bars:	684.25	684.25		76.06	
- tubes & pipes:	ex 684.25	ex 684.25	684.26		76.08
- tube & pipe fittings (e.g. joints, elbows, socket & flanges):	684.26	684.26	684.27	76.07	7609.00

Source: Department of International Economic and Social Affairs - Statistical Office - Statistical papers, Series M - United Nations - New York.

16. The members of this Group are: Aluminium Pechiney; American Bureau of Metal Statistics; Billiton International Metals BV; British Geological Survey; Department of Energy, Mines and Resources, Canada; Falconbridge Ltd; Inco Europe Ltd; International Lead and Zinc Study Group; International Wrought Copper Council; Le Nickel SLN; Metaleurop S.A.; Metallgesellschaft AG; Nuova Samim SpA; Outokumpu Mining Oy; United States Bureau of Mines; and World Bureau of Metal Statistics.

17. The Group meets annually in mid-year to review available data on production and consumption of the principal non-ferrous metals for the previous year and to discuss problems encountered in maintaining accurate and consistent coverage for individual countries. Between meetings, members remain in contact by reporting new or revised information received. The Group's actions have resulted in a much greater degree of consistency between the various sets of world data issued by member companies and organisations and published monthly or annually.

4. International Primary Aluminium Institute (IPAI)

18. The International Primary Aluminium Institute (IPAI) is an international association of companies engaged in the production of primary aluminium. The objectives of the Institute include the promotion of understanding of the world's aluminium industry including, inter alia, the collection and publication of statistical information relating to the international industry. IPAI has developed a statistical system geared to produce reliable and significant statistics. It includes all alumina and primary aluminium facilities throughout the world, with the exception of the former socialist countries of Europe (Hungary is now included), the socialist countries of Asia and former Yugoslavia. This system, based upon returns submitted by the primary aluminium and alumina producers themselves, is confidential in that the figures provided by individual companies are never disclosed in any circumstances. The companies' figures are aggregated by IPAI into Geographical Areas, so that the identity of individual producers is lost in the total. If in respect of any series there are insufficient producers in any one Geographical Area to ensure that individual figures are unidentifiable, the totals for that Area are combined with those of another Area.

19. IPAI issues seven statistical series using extremely precise definitions which ensure that published statistics are as far as practicable collected on the same basis and consistent, and give a uniform picture of the industry's activity:

- Primary aluminium production (monthly).
- Primary aluminium annual production capacity (six-monthly).
- Physical movement of primary aluminium between Geographical Areas 1-7 (IPAI producers) and Area 8 (former socialist countries of Europe and socialist countries of Asia).
- Inventories of unwrought aluminium including secondary metal (monthly).
- Aluminium recovered from purchased or tolled scrap (annually).
- Alumina production (quarterly).
- Alumina annual production capacity (six-monthly).

B. National sources

1. Official

20. Mine, Industry or Customs Departments of producing and consuming countries collect a certain amount of data from their own aluminium industry. The coverage and the definitions of the data as well as the coverage and the actual availability of the information released in regular official publications may vary considerably from one country to another.

21. Official services of some countries publish yearbooks on world mineral and metal statistics, including production and trade figures for bauxite, alumina and aluminium. "***Minerals Yearbook***" of the US Bureau of Mines, and "***World Mineral statistics***" of the British Geological Survey are the best known in this regard.

2. Private

22. The regional or national aluminium associations (e.g., Aluminium Association of the USA, European Aluminium Association, Japan Aluminium Federation) publish data on primary aluminium (production, external trade, consumption by end-uses) together with data on semi-manufactured products. Regular statistics on the world aluminium industry can be found also in publications issued by companies or private organisations. Among these, the most commonly used are:

- "***World Metal Statistics***", published monthly by the World Bureau of Metal Statistics, United Kingdom;

- "***Metal statistics***", published annually by Metallgesellschaft AG., Germany;

- "***Non Ferrous Metals***", published annually by Nuova Samim, Italy;

- "***Annuaire statistique Minemet***", published annually by Metaleurop S.A., France;

- "***Non-Ferrous Metal data***", published annually by the American Bureau of Metal Statistics, USA.

Each of these publications present a different set of data, but they can be assumed to be generally consistent and comparable, since their editing bodies are all members of the International Consultative Group on Non-Ferrous Metal Statistics.

23. Specific statistical data on aluminium industry in various countries are occasionally published in trade journals such as "***Mining Journal***" (weekly), "***Mining Magazine***" (monthly & annual), "***Metals Weeks***" (weekly), "***Metal Bulletin***" (twice weekly), "***Metal Bulletin Monthly***", "***World Mining***" (monthly), "***Mining Engineering***" (monthly), and "***American Metal Market***" (daily).

III. ANALYSIS OF AVAILABLE STATISTICS

24. A review of the accuracy and completeness of statistical data commonly available on bauxite, alumina and aluminium presents two different aspects. On

the one hand, the survey of completeness, frequency and availability of data is a relatively easy factual exercise. On the other hand, the analysis of the accuracy of data requires very high and specific competence on the bauxite/alumina/aluminium industry.

25. Section A below summarizes the findings of the UNCTAD secretariat, while section 4.2 presents the opinions commonly expressed by the representatives of government agencies or private companies.

A. Availability, frequency, completeness

26. Depending on the type of information needed and on the publication concerned, the availability of statistical data on bauxite, alumina and aluminium presents a high degree of variability.

1. Availability

27. The practical availability of statistical data can be assessed with regard to the extent to which satisfactory answers may be given to the following three questions:

- Are the data that are needed actually collected ?
- Are the data which are collected disclosed in regular publications ?
- Are these publications easy to acquire or to consult ?

28. The first question cannot be answered without knowing the detailed items of the statistical questionnaires sent to companies by the official services of producing or consuming countries. However, it can be assumed that the set of data requested and the ratio of the responses received may vary according to the importance of the aluminium industry in the country concerned.

29. Regarding the second point, it is obvious that various items of information, some of them of major importance, are collected but not published by the official bodies concerned, for technical reasons or in order to protect the commercial secrecy of reporting companies. For instance, the "***Quarterly mineral statistics***" issued regularly by the Australian Bureau of Agricultural and Resource Economics does not show the quantities of bauxite exported and the destination of alumina exports (which include aluminium hydroxide), and does not mention stocks. Aluminium producing countries of the former USSR are also particularly concerned by this point.

30. The third question raises the problem which could be the most easily solved. Indeed, the real value of an information, as important as it could be, lies in the fact that it is widely and timely disseminated among actual or potential users. The situation experienced by the United Nations and GATT libraries in Geneva shows that it is almost impossible to build and maintain a complete and up-to-date set of official national publications dealing with the minerals and metals industry: for most of the bauxite/alumina/aluminium producing or consuming countries, such publications do exist, but, especially in the case of developing or Eastern European countries, they are issued with increasing delays and sent very irregularly to users (when they are sent at all).

31. In terms of availability, it is clear that, in the present circumstances, private sources largely compensate their "unofficial" status and their inevitably restricted picture of the bauxite/alumina/aluminium industry (as most of them are not exclusively devoted to these commodities), by the fact that they are regularly up-dated and made quickly available at any place. Such sources represent a very useful supplement to the official, but sometimes unavailable, publications.

2. Frequency

32. The above observations are applicable to the problem of the frequency of information released: depending on the reporting country, it can be monthly, quarterly or annual. Global figures on production and trade are more usually disclosed on a monthly basis than other types of data. In the case of data published by private organisations, monthly figures are most of the time estimated on the basis of some previous period.

3. Completeness

33. The completeness of the data supplied is highly dependant on the reporting sources. On a national basis, some public agencies disseminate very detailed data, in particular:

- In its ***"Mineral industry surveys"***, the United States Bureau of Mines publishes, on a monthly basis, all the components of aluminium supply in the United States (production, trade and stocks), with special tables on scrap consumption and metallic recovery, including estimates for quantities not reported. On the other hand, as the structure of the industry precludes the disclosure of production data in a non-aggregate form, the part of this publication devoted to bauxite and alumina is issued quarterly and presents only imports and exports, by destinations and grades. More detailed data on the United States bauxite/alumina consumption, stocks and external trade are available in the ***"Minerals Yearbook"***.

- ***"Anuario Mineral Brasileiro"***, issued by the Department of Mines and Energy of Brazil, provides a very complete information on the Brazilian bauxite industry, from reserves by state and economic status to producer stocks, total trade (including all aluminium products), labour employed and investments. Unfortunately, the distribution of this publication now seems to be much more restricted than in the past.

Such publications have no equivalents in most of the other producing or consuming countries.

34. The following presents a summary picture of the present situation:

(i) Official data on production and trade of bauxite, alumina and aluminium are published by most producing and consuming countries, with a time-lag varying between two to twelve months or even more.

(ii) Stocks and reported consumption figures are very rarely supplied by any primary source.

(iii) The distinction between bauxite/alumina produced for aluminium-making purposes and bauxite/alumina for other uses, as well as the distinction between primary and secondary aluminium or old and new scrap imported, exported or consumed are not commonly made in existing publications.

(iv) As experienced by the UNCTAD secretariat in the collection of tin statistics, countries of the former USSR have started to release data on their mineral and metal activities through newly created statistical committees. Bauxite, alumina and aluminium statistics are likely to benefit from this development in the near future.

(v) China, which for decades did not supply any data on its aluminium industry, is now publishing its total trade ("aluminium ore, alumina oxide, aluminium and its alloys unwrought, and aluminium products") on a monthly basis, and its trade by origin and destinations on an annual basis. Production and consumption figures are still not available.

(vi) The regional grouping of the data collected from companies by the IPAI, as well as the exclusion of some major countries from the totals published, lessen significantly the geographical completeness of the data released. As inventory statistics refer only to inventories reported by IPAI producers, their geographical coverage is also incomplete.

(vii) Publications issued by members of the International Consultative Group on Non-Ferrous Metal Statistics present the most comprehensive set of statistics: world production and consumption tables are published on a country-by-country basis and the figures are comparable, even if not exactly identical; for some important producers or consumers, country tables provide data on trade by product and by origin and destination, on production of aluminium semi-manufactures and sometimes on consumption by end-uses.

B. Accuracy

35. In spite of the great number of available statistical publications on the aluminium industry, which are generally considered to be of a good quality, various problems persist, which are presented below.

1. Bauxite/alumina

36. Statistics on bauxite and alumina production are difficult to compile. Owing to a lack of agreed standards and definitions, published data are a mixture of shipments or production as well as of dry and wet weight for bauxite. For alumina, data refer to calcined alumina, alumina hydrate or Al_2O_3 equivalent of hydrate. For both bauxite and alumina, the quasi-general absence of data on the metallic and non-metallic uses and on the average recoverable aluminium content

of production and trade at the country level does not make it possible to produce supply/demand balances which could be usefully linked with supply/demand balances relating to primary aluminium.

2. Primary aluminium production

37. There are increasing difficulties in distinguishing between primary and secondary metal, as a result of technical change occurring in the primary production process.

3. Primary aluminium consumption

38. As a rule, the lack of data on inventories and external trade covering primary aluminium only (instead of all unwrought aluminium) makes estimates difficult for countries which are becoming significant consumers of primary aluminium. As a result, the figure for total consumption obtained by adding country by country substantially differs from the global estimate derived from available Western world data.

4. Secondary production and scrap

39. Data on this part of the aluminium industry are notoriously unsatisfactory; the problem arises both from the definition of scrap and the way scrap is collected. Recently, *Metallgesellschaft* (***Metal Statistics 1988***) stressed the "increasing difficulties of a timely presentation of important statistical data, to be used as a basis for reliable forecasts. One reason is the increasing use of old and new scrap in the supply for so-called "primary refineries" as is to be found recently, for example, in many aluminium primary smelters. Double counting caused by the direct use of scrap in the first processing stage is on the agenda in many countries, for example in the recycling of scrap from cans". Statistics are indeed available, but quality is extremely variable, definitions are not harmonized and the geographical coverage is not sufficient. Owing to the increasing role of this resource, the aluminium industry hopes to improve the quality of the data related to secondary recovery.

5. Consumption by end-uses

40. Data are only available for a limited number of countries. In addition, nomenclature differs from one country to another. "Important industrial countries such as USA and United Kingdom rely on voluntary reports from industry only. Statistics dealing with end-uses derived in this way are of very limited value as, for example, for zinc, aluminium and nickel in the USA. For Japan we have decided, in agreement with the other relevant statistical institutions, to calculate the consumption of refined copper and primary aluminium in line with our own knowledge and methods, thus deviating from the official sources..." (*Metallgesellschaft* - ***Metal Statistics 1988***).

6. Stocks

41. Stock figures from exchanges (LME, COMEX) are accurate and easily available. Figures on producer stocks of the Western world made available by IPAI are considered acceptable but their coverage is incomplete. Consumer and merchant stocks data are non-existent for almost all the consuming countries. In its

comments (see annex), the Canadian delegation points out that an eventual identification of the countries of origin and destination in the publication of the LME inventories would substantially contribute to the transparency of the market: the present situation, where the final destination of metal is not known, leads to overestimating of the trade flows towards the countries where the warehouses are located.

7. Trade

42. On the whole, data on external trade are good, within the limits of the definitions: bauxite and alumina for metallic and non-metallic uses, primary and secondary aluminum are aggregated in any international trade nomenclatures, where furthermore the specific units used (e.g dry or wet weight for bauxite, Al_2O_3 equivalent for alumina) are not defined; trade data of some countries still aggregate unalloyed and alloyed unwrought aluminium.

43. On the other hand, Customs reports do not generally identify the country of first origin or of last destination and may lead to some double-counting. Lastly, there is often some discrepancy between external trade figures published by the Customs departments, collected from the customs declarations in terms of quantity and f.o.b. or c.i.f. value, and those supplied by the companies, representing most of the time the foreign shipments from their plants: the period of recording, for the same physical quantities, may noticeably vary.

44. The suppression of data on grounds of confidentiality sometimes adds to these "structural" inadequacies of the nomenclature. Attempts to recover the withheld information by using partners' trade reports are in that case very hazardous, for the above reasons. The consequence of such gaps in the trade flows is also that it is virtually impossible to reasonably estimate the consumption of many of the smaller countries without domestic producing industries.

8. Total consumption

45. For all the above reasons, official figures for reported consumption in most countries, when available, differ substantially from the apparent consumption data commonly used in international compilations.

9. Countries of Eastern Europe

46. Except for Hungary or Poland, which continued to release figures on production and external trade on bauxite, alumina and aluminium during the last 15 years, the present state of the statistical information in the former socialist countries of Eastern Europe is very poor, although one of them is one of the major world aluminium producing and exporting countries. The data which have been newly published are not currently provided in a systematic form and, at times, are partial and contradictory. As noted in the 1993 edition of ***Metals & Minerals Annual Review***, "more information was made publicly available on the CIS aluminium industry during the year, particularly as a result of a conference organised by the producers' association Concern Aluminiy, in September. ... Figures were also released on trade ..., but problems of definition and coverage mean that the position remains somewhat confuse".

IV. CONCLUSIONS

47. Improving the transparency of the international bauxite/alumina/aluminium market depends on the ability to improve the quality and availability of published international statistics on bauxite/alumina and aluminium. Production, trade, stocks and consumption are likely to be the key statistical items in the first step of such an exercise.

48. An examination of the coverage of existing national and international statistical data sets suggests that useful action could be taken first on the following points:

(i) Harmonization of the specific definitions and units of measurement of the various products;

(ii) Harmonization of the definition of the various stages of production and consumption;

(iii) Distinction between primary and secondary aluminium in the trade data;

(iv) Systematic collection of data on stocks held by merchants and consumers;

(v) Review of existing country statistical reporting systems to take account of technological and other changes;

(vi) Special attention to ensure the timely publication, in whatever appropriate form, and the widest dissemination, by whatever appropriate means, of available statistical information from all countries, including countries which at present do not publish complete statistics on bauxite, alumina and aluminium.

Annex

COMMUNICATION RECEIVED FROM CANADA

COMMENTS FROM CANADIAN PARTICIPANTS

Production

Canadian data on primary aluminium production are consistent with IPAI data; that is to say, they measure the metal taken from the electrolytic vats. Because of this, the data cannot be distorted through the possibility of metal re-entering the production chain (comment made in OECD document CE/CG(89)10, p. 4). The data collection system in operation works well and the Canadian industry considers the published data to be very reliable.

As far as secondary aluminium production is concerned, Statistiques Canada does not publish a report on this subject, although some partial data are in fact compiled on the occasion of the annual survey of aluminium consumption. This question could be studied, if need be, as part of a more thorough examination of our data collection procedures.

Consumption

Canadian data on aluminium consumption are collected through an annual survey. Although the rate of reply to these surveys is improving regularly, the respondents do not yet represent the entire industry. Furthermore, Canadian consumption data are established in terms of the type of processing of the metal (such as casting, forging, extrusion, lamination, powder, deoxidation, secondary production, etc. ...) and not by type of industry or end use (such as automobile, construction, packaging, etc. ...).

Although they consider the quality of the data to be acceptable, Canadian aluminium producers feel that American and Japanese consumption data are generally more complete and believe that Canadian data (and those of several other countries) should possibly be comparable to them. This question, too, might be more thoroughly examined in a broader context. IPAI does not publish anything on consumption, whereas WBMS produces a world compilation that is acceptable in most cases.

Stocks/inventories

Canadian data on stocks are partial and do not take into account all the following types of inventories: from producers, consumers and merchants. Data are compiled through an annual survey of respondents identified as producers of pure aluminium or aluminium alloys. Although the inventories of primary aluminium producers are not published, this does not mean they have been omitted. Apparently no data are compiled with respect to merchants and other intermediaries.

Although data collection procedures could be improved, account should be taken of the cost-benefit ratio given the relatively modest size of the Canadian domestic market and, therefore, of the statistical value of some of these data

(merchantable stocks, for example). As for the IPAI data, they are fairly reliable and have the advantage of continuity in time. However, regional groupings are outmoded and prevent close analysis of the markets.

Trade data

Canadian trade data are published monthly by Statistiques Canada with no omissions whatsoever. Since 1987 Canada has been using the Harmonized Commodity Description and Coding System and publishes the data in the following forms: imports, domestic exports, total exports (i.e. including re-exports). Unlike Japan, for example, Canadian data on international trade make no distinction between primary and secondary aluminium.

Under an agreement between Canada and the United States, the two countries' trade data are exchanged in such a way that one uses the other's imports to evaluate its own exports. Canadian trade data are directly accessible via the TIERS electronic data bank designed by Statistiques Canada.

Canadian industry believes that Canadian trade data are generally quite reliable. However, owing to the growth of exports to LME warehouses, mainly those of Rotterdam, the volume of exports to the Netherlands is overestimated. This situation is detrimental to market transparency, for little is known about the final destinations of the metal. It has therefore been wondered in some quarters whether LME might possibly publish its inventories with an identification of the countries of origin and destination.

The question remains in abeyance as regards European data, which are being affected by the establishment of the single market. The commitments made by the European authorities imply that market transparency will not be lessened by this change.

Data continue to be omitted deliberately in certain countries, especially as regards bauxite and alumina. Delays in publication of data by other aluminium-producing countries also have effects similar to those deriving from the omission of data.

Primary-secondary distinction

By and large, Canadian data are much more complete as regards primary aluminium. This situation is basically due to historical reasons and to the fact that Canada is a major producer of primary aluminium. However, growth in the production and consumption of secondary aluminium might possibly lead to this question being studied in Canada, especially if industry were to express a need for it.

From a more general point of view, world data on the production and consumption of secondary aluminium are fairly approximate, despite its growing (and at times leading) importance. Furthermore, complete data on international trade in secondary metal are non-existent. This is an extremely complex question that can only be resolved in a multilateral framework.

Energy, Mines and Resources Canada / Énergie, Mines et Ressources Canada

Minerals / **Minéraux**

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ANNUAL SURVEY – ENQUÊTE ANNUELLE

CONSUMPTION OF ALUMINUM METAL
CONSOMMATION D'ALUMINIUM MÉTAL
1992

IMPORTANT

Kindly complete and return this form within 30 days of receipt. Collected under the authority of the federal *Resources and Technical Surveys Act* CR-7, R.S.C. 1970.

Retourner ce questionnaire dûment rempli dans les 30 jours. Déclaration exigée en vertu de la *Loi sur les ressources et les relevés techniques* CR-7, R.S.C. 1970.

100.1 Name of person responsible for this report – Nom de la personne responsable de ce rapport

100.2 Telephone (area code and number) Téléphone (indicatif régional numéro)

100.3 Facsimile – Télécopieur

Please correct any mistakes in Name or Address – Prière de corriger le nom ou l'adresse, s'il y a lieu

TABLE "A". Receipts and inventories of aluminum metal. TABLEAU «A». Arrivages et stocks d'aluminium métal.	Primary aluminum ingot and alloys – Lingots et alliages de première fusion	Purchased secondary ingot – Lingots de deuxième fusion achetés	Outside scrap – Rebuts provenant de l'extérie
	Kilograms – kilogrammes (1)		
Opening inventory (+) Stocks d'ouverture (+)			
2.1 Plant Receipts (+) Arrivages à l'usine (+)			
3.1 Aluminum Metal Shipments (–) Expéditions d'aluminium métal (–)			
4.1 Total Consumption of Metal (line 6.1 + line 11.1) (–) Consommation totale de métal (ligne 6.1 + ligne 11.1) (–)			
5.1 Closing inventory Stocks de fermeture			

TABLE "B". Consumption of aluminum metal. TABLEAU «B». Consommation d'aluminium métal.	Primary aluminum ingot and alloys – Lingots et alliages de première fusion	Purchased secondary ingot – Lingots de deuxième fusion achetés	Outside scrap – Rebuts provenant de l'extérie
Aluminum metal used during year for, or in the production of – Aluminium métal utilisé pendant l'année pour les produits suivants ou dans leur fabrication :	Kilograms – kilogrammes (1)		
6.1 Secondary ingot – Lingots de deuxième fusion		XXX	
7. Castings – Moulages :			
7.1 Die – Sous pression			
7.2 Permanent mould – En coquilles			
7.3 Sand – En sable			
7.4 Other (including cast busbar) – Autres (y compris les barres omnibus moulées)			
8. Wrought products – Produits ouvrés :			
8.1 Extrusions (including pipe) – Par extrusion (y compris les tuyaux)			
8.2 Forgings and impact slugs – Pièces forgées et piècettes			
8.3 Sheet, plate, coil or foil – Feuilles, plaques, bobines ou lames			
8.4 Wire rod and other rolled shapes – Tiges et autres laminés			
9.1 Destructive uses (deoxidizer) – Usages destructifs (désoxydants)			
10. Other uses – Autres usages :			
10.1 Non aluminum base alloys – Alliages à base autre que d'aluminium			

10.2 Powders and paste – Poudres et pâtes			
10.3 Other uses (specify) – Autres usages (préciser)			
11.1 TOTAL USED (excluding secondary line 6.1). TOTAL UTILISÉ (sauf deuxième fusion, ligne 6.1).			

1) SI conversion factor: 1 lb. = 0.453 592 37 kg. – Facteur de conversion au système international : 1 livre = 0,453 592 37 kilogramme.

ENQUÊTE SUR LA CONSOMMATION D'ALUMINIUM MÉTAL: DIRECTIVES À L'INTENTION DES RÉPONDANTS

L'ALUMINIUM MÉTAL DÉSIGNE LES LINGOTS ET LES ALLIAGES D'ALUMINIUM DE PREMIÈRE FUSION, LES LINGOTS D'ALUMINIUM DE SECONDE FUSION ET LES REBUTS DE L'EXTÉRIEUR.

Les lingots et les alliages d'aluminium de première fusion désignent les lingots refondus (consommés à des fins de refonte), les lingots obtenus par extrusion (consommés pour produire des tiges, des tubes et des billettes), les lingots de laminage (consommés pour la production de brames), les barres à fil et le métal fondu (première fusion).

Les lingots de seconde fusion désignent les lingots de seconde fusion et le métal fondu de seconde fusion achetés.

Les rebuts de l'extérieur désignent les rebuts d'aluminium achetés à l'état "nouveau" ou "ancien". Les rebuts produits à l'installation et consommés par la génératrice ne sont pas inclus. Veuillez prendre note que les lingots d'alliages de refonte ne comportant pas de spécifications sont classifiés comme des rebuts.

TABLEAU A: ARRIVAGES ET STOCKS D'ALUMINIUM MÉTAL

Indiquer, à la colonne pertinente de chaque ligne, la consommation d'aluminium métal.

Ligne 1. Stocks d'ouverture
Déclarer les stocks d'aluminium métal au début de l'année. Ne pas indiquer les stocks de produits semi-ouvrés ou ouvrés.

Ligne 2. Arrivages à l'usine
Déclarer les achats d'aluminium métal faits par votre société au cours de la période visée par le rapport.

Ligne 3. Expéditions
Déclarer la quantité d'aluminium métal expédiée sans frais au cours de la période visée par le rapport. Ne pas déclarer les stocks de produits semi-ouvrés ou ouvrés.

Ligne 4. Consommation totale
Déclarer la consommation d'aluminium métal. À chaque colonne, les données inscrites à la ligne 4 doivent correspondre au total des données des lignes 6 et 11.

Ligne 5. Stocks de fermeture
Déclarer les stocks d'aluminium métal à la fin de la période visée par le rapport. Ne pas déclarer les stocks de produits semi-ouvrés et ouvrés.

TABLEAU B: CONSOMMATION D'ALUMINIUM MÉTAL

Ligne 6. Lingots de seconde fusion
Déclarer la consommation d'aluminium métal à des fins de production de lingots de seconde fusion destinés soit à la vente ou à des utilisations internes.

Lignes 7.1, 7.2, 7.3 et 7.4. Moulages
Déclarer la consommation d'aluminium métal à des fins de production de moulages.

Lignes 8.1, 8.2, 8.3 et 8.4. Produits ouvrés
Déclarer la consommation d'aluminium métal à des fins de production de produits ouvrés.

Ligne 9. Usages destructifs
Déclarer la consommation d'aluminium métal pour des usages destructifs comme la déoxydation de l'acier, la fabrication de torches et d'explosifs, etc.

Lignes 10,1, 10.2 et 10.3. Autres usages
Déclarer la consommation d'aluminium métal pour d'autres usages.

Ligne 11. Consommation d'aluminium métal
Les données de la ligne 11 doivent correspondre au total de celles des lignes 7.1 à 10.3 inclusivement. Ne pas inclure la ligne 6 dans le total de la ligne 11.

ALUMINUM METAL SURVEY: INSTRUCTIONS TO RESPONDENTS

ALUMINIUM METAL REFERS TO PRIMARY ALUMINUM INGOT AND ALLOYS, SECONDARY ALUMINUM INGOT AND OUTSIDE ALUMINUM SCRAP

Primary aluminum ingot and alloy refers to remelt ingot (consumed for remelt purposes), extrusion ingot, (consumed to produce rods, tubes and billets), sheet ingot, (consumed to produce slabs), wire bar and molten metal in primary form.

Secondary ingot refers to purchased secondary ingot and molten metal in secondary form.

Outside scrap refers to "new" and "old" purchased aluminum scrap. Internally generated scrap consumed by the generator is not included. Note than non-specification remelt alloy ingot is classified as scrap.

TABLE A: RECEIPTS AND INVENTORY OF ALUMINUM METAL

For each line, report the quantity of aluminum metal consumed in the appropriate column.

Line 1. Opening Inventory
Report aluminum metal on hand at the beginning of the year. Do not report inventories of semi-fabricated or finished products.

Line 2. Plant receipts
Report aluminum metal purchased by your company during the reporting period.

Line 3. Shipments
Report the quantity of aluminum metal shipped without change during the reporting period. Do not report inventories of semi-fabricated or finished products.

Line 4. Total Consumption
Report aluminum metal consumed. For each column, the entry in line 4 should equal the entry in line 6 plus the entry in line 11.

Line 5. Closing Inventory
Report aluminum metal on hand at the end of the reporting period. Do not report inventories of semi- fabricated or finished products.

TABLE B: CONSUMPTION OF ALUMINUM METAL

Line 6. Secondary ingot
Report aluminum metal consumed to produce secondary ingot which is intended either for sale, or for internal use.

Line 7.1, 7.2, 7.3, and 7.4. Castings
Report aluminum metal consumed to produce castings.

Line 8.1, 8.2, 8.3, and 8.4. Wrought products
Report aluminum metal consumed to produce wrought products.

Line 9. Destructive uses
Report aluminum metal consumed in destructive uses such as steel de-oxidation, flares and explosives etc.

Line 10.1, 10.2 and 10.3. Other uses
Report aluminum metal consumed in other uses.

Line 11. Consumption of aluminum metal
The entries in line 11 should equal the total of entries in lines 7.1 through 10.3 inclusive. Do not include line 6 in the line 11 total.